

Three species of the subgenus *Bessobates* Townes, Townes & Gupta of *Netelia* Gray (Hymenoptera: Ichneumonidae: Tryphoninae) new to South Korea

Jin-Kyung Choi^{1,2,*}

¹Department of Science Education, Daegu National University of Education, Daegu 42411, Republic of Korea

²Insect Inquiry · Education Institute, Daegu National University of Education, Daegu 42411, Republic of Korea

*Correspondent: jkchoi624@dnue.ac.kr

Three newly recorded species of the subgenus *Bessobates* of *Netelia* Gray, 1860 are reported. Three species, *Netelia* (*Bessobates*) *longipad*, *N. (B.) pallescens* and *N. (B.) yakushimensis*, are recorded for the first time from South Korea. Photographs and diagnoses of three unrecorded species of this subgenus are provided.

Keywords: *Bessobates*, Korea, *Netelia*, new record, taxonomy

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INTRODUCTION

Netelia Gray, 1860 is one of largest nocturnal genus within the family Ichneumonidae and its distribution is worldwide. Most *Netelia* are known to be ectoparasitic koinobionts of lepidopteran larvae. This genus *Netelia* is uniformly brownish yellow Darwin Wasps (Konishi, 2014) and this genus can be best identified by specialized structures of the male genitalia (Townes, 1938). More than 330 species have so far been recorded and divided into 12 subgenera worldwide. Until now, 31 species of eight subgenera recorded from South Korea (Lee, 2021). Among them, the subgenus *Bessobates* was reported as a genus by Townes *et al.* (1961) based on *Parabatus deceptor*. 22 species have been recognized from the Holarctic, Oriental and Neotropical regions.

In this study, three South Korean species of *Bessobates* are revised. Diagnoses and photographs of the South Korean species are provided.

MATERIALS AND METHODS

Specimens are preserved in the Insect Inquiry · Education Institute in Daegu National University of Education (DNUE-IEI, Daegu, Korea), Nakdonggang National Institute of Biological Resources (NNIBR, Sangju, Korea). Images of specimens of the new species were taken using an AxioCam MRc5 camera attached to a stereo microscope (Zeiss SteREO Discovery. V20; Carl Zeiss,

Göttingen, Germany), processed using AxioVision SE64 software (Carl Zeiss), and optimized with a Delta imaging system (i-solution, IMT i-Solution Inc. Vancouver, Canada) and a Leica MC190 HD Camera attached to a Leica M125 Microscope (Leica Microsystems, Germany) with images, processed using LEICA LAS X software (Leica). Morphological terminology follows mostly that of Gauld (1991) and terminology for the male genitalia follows that of Snodgrass (1941). Dissections of the genitalia were prepared following Konishi (2005) and head and mesosoma were measured by the methods of Konishi (1985). Konishi's key was used to distinguish between these three species (Konishi, 2014). The following indices (Gauld and Michell, 1981) are used:

Geno-orbital index = maximum breadth of eye in profile / maximum breadth of gena in same line

Nervellar index of hind wing = length of Cu1 between cu-a and M / length of cu-a

Abbreviations are as follows: **NIAES**, Laboratory of Insect Systematics, National Institute for Agro-Environmental Sciences, Tsukuba, Japan; **GN**, Gyeong-sangnam-do; **GW**, Gangwon-do; **JJ**, Jeju-do.

SYSTEMATIC ACCOUNTS

Family Ichneumonidae Latreille, 1802 맵시벌과
Subfamily Tryphoninae Shuckard, 1840
뭉툭맵시벌아과

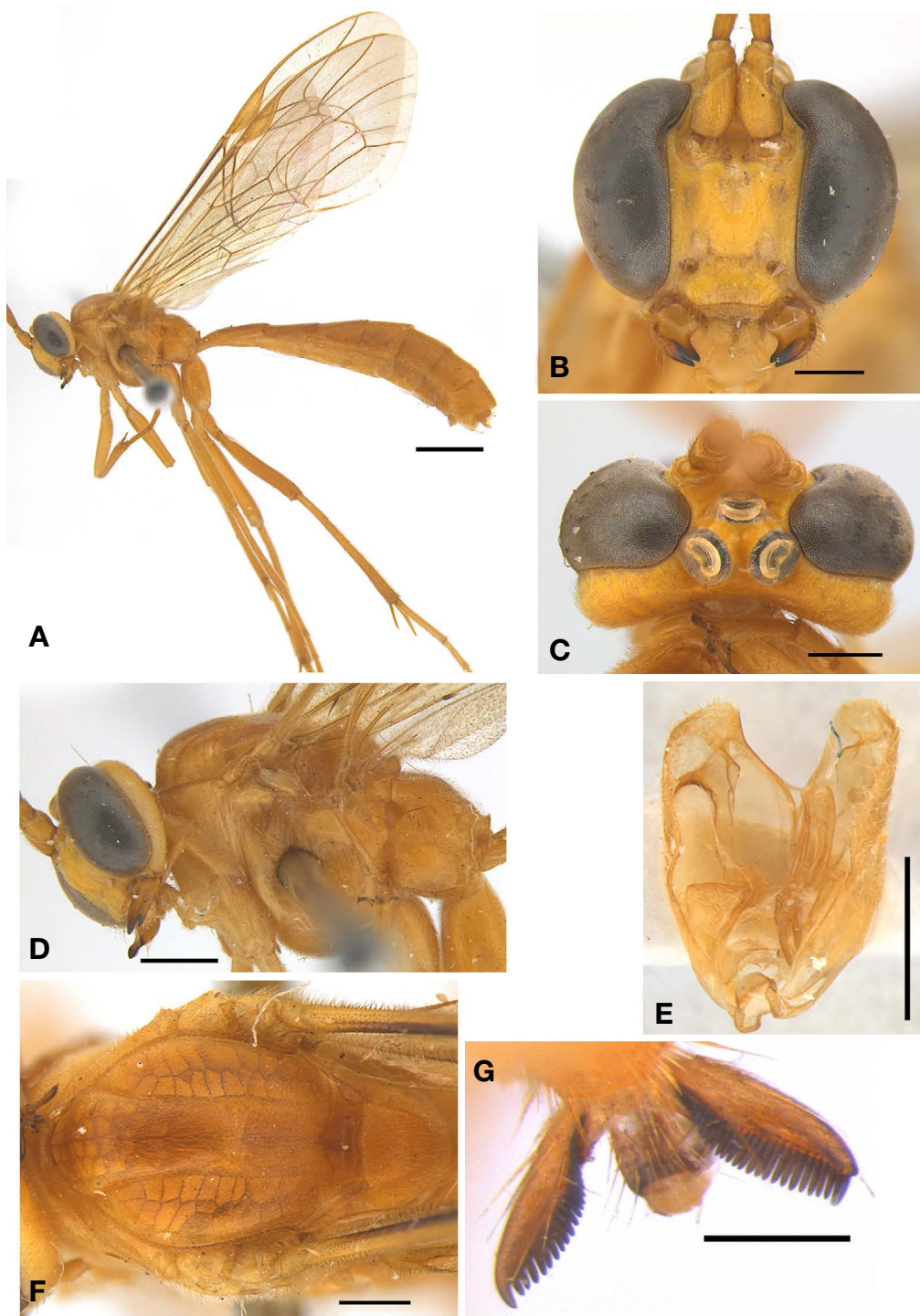


Fig. 1. *Netelia (Bessobates) longipad* A, Habitus, lateral view; B, Head, frontal view; C, Head, dorsal view; D, Head and mesosoma, lateral view; E, Male genitalia; F, Mesoscutum, dorsal view; G, Tarsal claws. Scale bars: 2 mm: A; 1 mm: D, E; 0.5 mm: B, C, F; 0.2 mm: G.

Genus *Netelia* Gray, 1860 자루맷시벌속
Netelia Gray, 1860: 341. Type species: *Paniscus inquinatus* Gravenhorst, 1829

Subgenus *Bessobates* Townes, Townes & Gupta, 1961 등검정자루맷시벌아속
Bessobates Townes, Townes & Gupta, 1961: 1-522. Type species: *Parabatus deceptor*

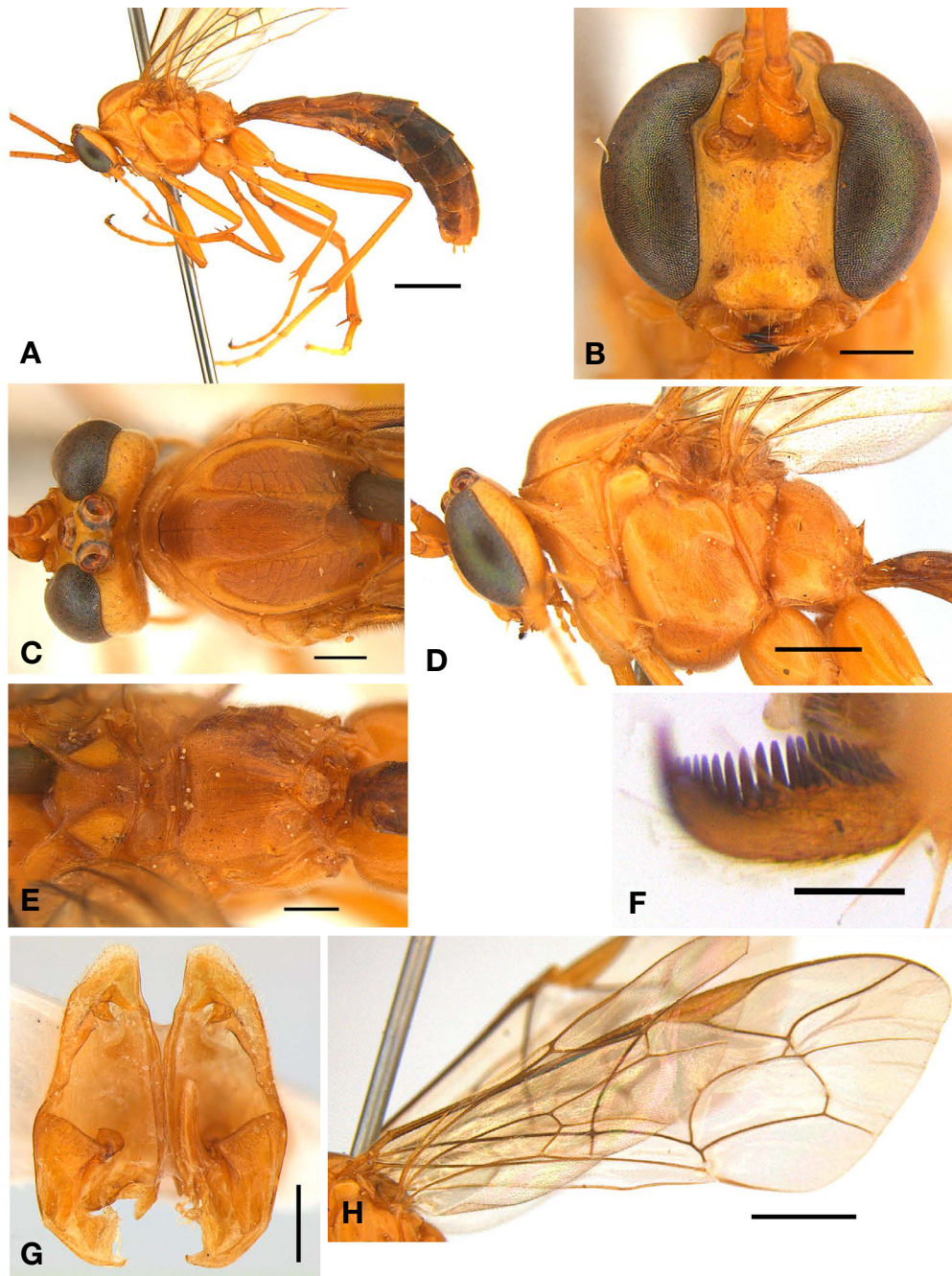


Fig. 2. *Netelia (Bessobates) pallescens* A, Habitus, lateral view; B, Head, frontal view; C, Head and mesoscutum, dorsal view; D, Head and mesosoma, lateral view; E, Propodeum, dorsal view; F, Hind tarsal claw; G, Male genitalia; H, Fore wing. Scale bars: 2 mm: A, H; 0.5 mm: B–E, G; 0.1 mm: F.

Diagnosis. Occipital carina absent. Lateral carina of scutellum not extending to apex of scutellum. Cu-a almost opposite Rs&M; 3r-m present. In female, the short ovipositor is the unique character, as long as apical depth of metasomal tergite. In male, the overhang of the sub-apical sclerotized plate of the paramere and the strongly curved basal apodeme of the aedeagus.

***Netelia (Bessobates) longipad* Konishi, 2014**

끝긴등검정자루맴시벌 (신칭) (Fig. 1)

Netelia (Bessobates) longipad Konishi, 2014: 322. Type: male; TD: NIAES.

Diagnosis. Vertex evenly rounded in dorsal view; geno-orbital index 2.0–2.2; antenna with 50–57 flagel-



Fig. 3. *Netelia (Bessobates) yakushimensis* A, Habitus, lateral view; B, Head, frontal view; C, Mesosoma, dorsal view; D, Head, dorsal view; E, Head and mesosoma, lateral view; F, Wings; G, Male genitalia. Scale bars: 2 mm: A, F; 0.5 mm: B-E, G.

lomeres. Upper tooth of mandible much longer than lower tooth. Scutellar lateral carina fading out basal 1/3 of scutellum; propodeum weakly trans-striate on about basal 0.7, with weak crest; nervellar index 0.7–0.9. Dorsal and ventral margins of paramere slightly emarginated subapically; digitus truncate and ventro-apical corner

without any teeth; pad long, extending anterior area and meeting apical 2/3 of paramere. Occiput and interocellar area light brownish yellow. Mesosternum and mesopleuron with light brown markings irregularly.

Material examined. [South Korea] 1♂, [GN] Hadong-gun, Bukcheon-myeon, Jikjeon-ri, Mt. Emyeonsan, 14-

15.v.1999, J.S. Park (DNUE_IIIEI); 1♂, Hadong-gun, Cheongam-myeon, Gunghang-ri, Jusan, 1-2.vi.2002, E.S. Lee (DNUE_IIIEI); 1♂, Ulju-gun, Ungchon-myeon, Eunhyeon-ri, Mujaechi 1 Wetland, 1-2.vi.2001, J.S. Park (DNUE_IIIEI); 1♂, ditto, J.K. Choi (NNIBR: NNI-BRIN213162).

Distribution. South Korea (new record), Japan.

Netelia (Bessobates) pallescens (Schmiedeknecht, 1910) 연노랑등검정자루맵시벌 (신칭) (Fig. 2)

Parabatus pallescens Schmiedeknecht, 1910: 1851. Type: male; TD: SCHMIEDEKNE.

Diagnosis. Vertex evenly rounded in dorsal view; geno-orbital index 2.2–2.7; antenna with 43–53 flagellomeres. Scutellar lateral carina fading out basal 1/4 of scutellum; propodeum weakly or distinctly trans-striate in middle, with weak crest; nervellar index 0.4–0.5. Paramere subelliptic, dorsal and ventral margins of paramere slightly emarginated subapically; dorso-apical corner of digitus rounded and ventro-apical corner with 1–2 teeth; membrane of median surface with strip of minutely papillate cuticle, long and weakly curved; pad large situated at apical 1/4 of paramere in middle. Mesoscutum with light brown stripes on each of median and lateral lobes; mesosternum and mesopleuron with brownish yellow markings.

Material examined. [South Korea] 1♂, [GN] Hadong-gun, Akyang-myeon, Deungchon-ri, Hyeongjaebong, 10–11.v.2002, T.H. Ahn (DNUE_IIIEI); 1♂, [GW] Ganseong, Geonbongsa, 22.v.1992, J.W. Lee (NNIBR: NNI-BRIN166271); 1♂, [JJ] Jeju-si, Yongsil, Giam, 2.vi.1968 (DNUE_IIIEI).

Distribution. South Korea (new record), Japan, Germany, Ukraine and United Kingdom.

Netelia (Bessobates) yakushimensis Konishi, 2014

작은등검정자루맵시벌 (신칭) (Fig. 3)

Netelia (Bessobates) yakushimensis Konishi, 2014: 339. Type: male; TD: NIAES.

Diagnosis. Vertex evenly rounded in dorsal view; geno-orbital index 2.6–2.9; antenna with 51–53 flagellomeres. Scutellar lateral carina fading out beyond middle of scutellum; propodeum trans-striate on basal 0.65, with crest or without and represented by rounded swelling; nervellar index 0.5–0.6. Paramere long, apical margin of paramere acutely rounded; dorso-apical corner of digitus rounded off and ventral-apical corner with teeth; membrane of median surface with subtriangular area of minutely papillate cuticle; pad subtriangular, situated at apical 1/4 of paramere in middle. Mesoscutum with brown stripes on each of median and lateral lobes and a brown spot situated behind median stripe or fused anteriorly; me-

sopleuron with yellow markings.

Material examined. [South Korea] 1♂, [GN] Hadong-gun, Akyang-myeon, Deungchon-ri, Hyeongjaebong, 10–11.v.2002, J.S. Shin (NNIBR: NNIBRIN166272); 2♂♂, [GW] Ganseong, Geonbongsa, 22.v.1992, J.W. Lee (DNUE_IIIEI); 1♂, Samcheok-si, Hajang-myeon, Galjeon-ri, 16.v-5.vi.2007, P. Tripotin (DNUE_IIIEI); 1♂, [JJ] Jeju-si, Yongsil, Giam, 2.vi.1968 (DNUE_IIIEI); 1♂, Jeju-si, Hallasan, 22.v.1968, S.M. Lee (DNUE_IIIEI).

Distribution. South Korea (new record), Japan.

CONFLICTS OF INTEREST

The author of this paper has no affiliation with any interests and is solely responsible for the paper.

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